

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows. Claims 22, 23, 28, 29, and 35-37 are canceled without prejudice or disclaimer to the subject matter contained therein.

1-19 (Canceled)

20 (Currently Amended) A plasma etching method of performing plasma etching to an object made of silicon in a treatment chamber, said plasma etching method comprising:

introducing, into the treatment chamber, an etching gas which includes a fluorine compound gas and a rare gas;

energizing the etching gas into a plasma state by supplying electricity to the etching gas, the electricity having a frequency that is equal to or more than 27 MHz; and

etching the object using the plasma,

wherein the fluorine compound gas is one of sulfur hexafluoride (SF₆) gas and nitrogen trifluoride (NF₃) gas,

wherein the rare gas is helium (He) gas, and

wherein a volumetric flow rate of the helium (He) gas introduced into the treatment chamber is equal to or more than 80% of a total volumetric flow rate of the etching gas.

21 (Original) The plasma etching method according to Claim 20,
wherein the etching gas further includes one of oxygen (O₂) gas, carbon monoxide (CO) gas, and carbon dioxide (CO₂) gas, and
the fluorine compound gas is sulfur hexafluoride (SF₆) gas.

22 (Canceled)

23 (Canceled)

24 (Currently Amended) The plasma etching method according to Claim 21, 23,
wherein an inside wall of the treatment chamber is made of an insulating material.

25 (Original) The plasma etching method according to Claim 24,
wherein the insulating material is one of quartz, alumina, an aluminum matrix with
alumite treatment, yttrium oxide, silicon carbide, and aluminum nitride.

26 (Original) The plasma etching method according to Claim 21,
wherein the etching gas further includes chlorine (Cl₂) gas.

27 (Currently Amended) The plasma etching method according to Claim 26,
wherein a volumetric flow rate~~volume~~ of the chlorine (Cl₂) gas introduced into the
treatment chamber is equal to or less than 10% of a total volumetric flow rate of the etching gas.

28 (Canceled)

29 (Canceled)

30 (Original) The plasma etching method according to Claim 20,
wherein the etching gas further includes polymer forming gas, and
the fluorine compound is sulfur hexafluoride (SF₆) gas.

31 (Original) The plasma etching method according to Claim 30,
wherein the polymer forming gas is one of octafluorocyclobutane (C₄F₈) gas,
trifluoromethane (CHF₃) gas, octafluorocyclopentene (C₅F₈) gas, and hexafluorobutadiene (C₄F₆)
gas.

32 (Currently Amended) The plasma etching method according to Claim 20,
wherein the etching gas further includes one of oxygen (O₂) gas, carbon monoxide (CO)
gas, and carbon dioxide (CO₂) gas,
the fluorine compound gas is sulfur hexafluoride (SF₆) gas,
the etching gas comprises a first etching gas, and
etching the object using the plasma constitutes~~comprises~~ a first etching,

the method further comprising:

 a second etching of the object after the first etching using a second etching gas which includes a polymer forming gas and sulfur hexafluoride (SF₆) gas as a fluorine compound gas.

33 (Previously Presented) The plasma etching method according to Claim 20,

 wherein the etching gas is energized into a plasma state by an inductively coupled plasma (ICP) method.

34 (Original) A device which etches a silicon substrate,

 said device forming a trench in the silicon substrate using the plasma etching method according to Claim 20.

35-37 (Canceled)